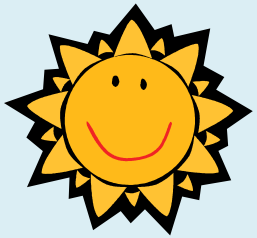
Unit 2 Day 1

FRED Functions



Arrival

Pick up Papers by window!

Start on Fred Functions Packet

Fred Functions

After you finish a CheckPoint, check in with teacher before continuing! ☺

Homework Tonight

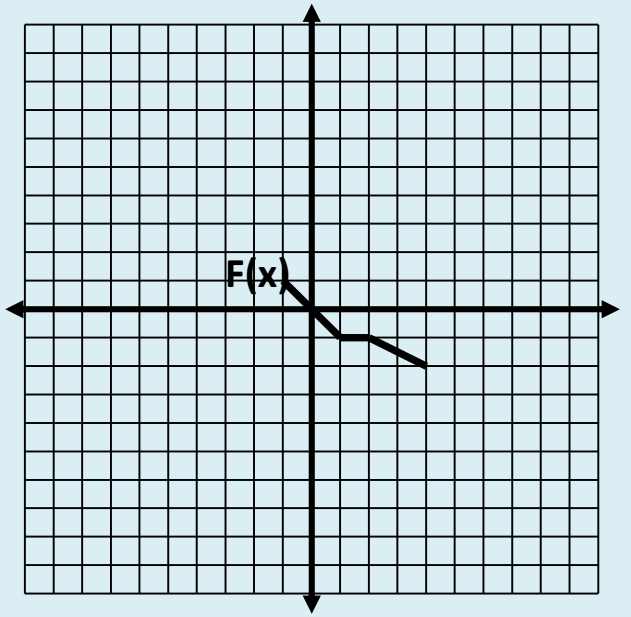
Unit 2 Homework Packet p. 1-3
If you get stuck, complete parts of Fred Notes that you didn't finish in class

Print Unit 2 HW Packet, if not yet!
You MUST have a printed copy for Unit 2, due to all of the graphs! Remember,
if you can't print, you must still do the HW! ☺

Get and bring to class daily:
1) Graph Paper
2) Tape
3) Scissors
4) Colored pen/pencil
5) Graphing Calculator

Fred Functions

To the right is a graph of a **"Fred" function**. We can use Fred functions to explore transformations in the coordinate plane. Let's review briefly.



Explain what we mean by the term domain.

The set of all inputs (**x-values**) of a function or relation

1. Using the graph, what is the domain of Fred?

$$\{x \mid -1 \le x \le 4\}$$

Explain what we mean by the term range.

The set of all outputs (**y-values**) of a function or relation

2. Using the graph, what is the range of Fred?

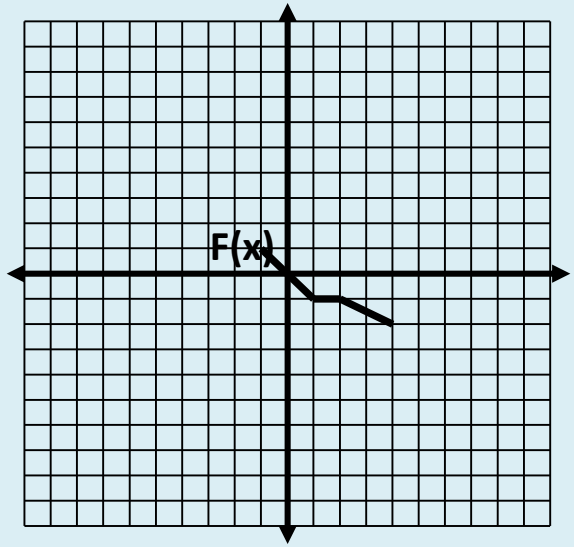
$$\{y \mid -2 \le y \le 1\}$$

Fred Functions

Let's explore the points on Fred.

3. How many points lie on Fred? Infinite!

Can you list them all? Nope!



4. What are the key points that would help us graph Fred?

(-1, 1), (1, -1), (2, -1), (4, -2)

We are going to call these key points **"characteristic" points**.
It is important when graphing a function that you are able to identify these characteristic points.

Use the graph of graph to evaluate the following.

F(1) = -1 F(–1) = 1 F(4) = –2 F(5) = Undefined! Not in the domain

Continue
Fred Functions

After you finish checkpoint, remember to check in with teacher!

Checkpoint p. 2

Equation	Effect to Fred's graph
Example: y=F(x) + 18	**Translate up 18 units**
1. y = F(x) – 100	**Translate down 100 units**
2. y = F(x) + 73	**Translate up 73 units**
3. y = F(x) + 32	**Translate up 32 units**
4. y = F(x) – 521	**Translate down 521 units**

Fred Functions

p. 3-4

After doing BOTH checkpoints, remember to check in with teacher!

Checkpoint p. 4

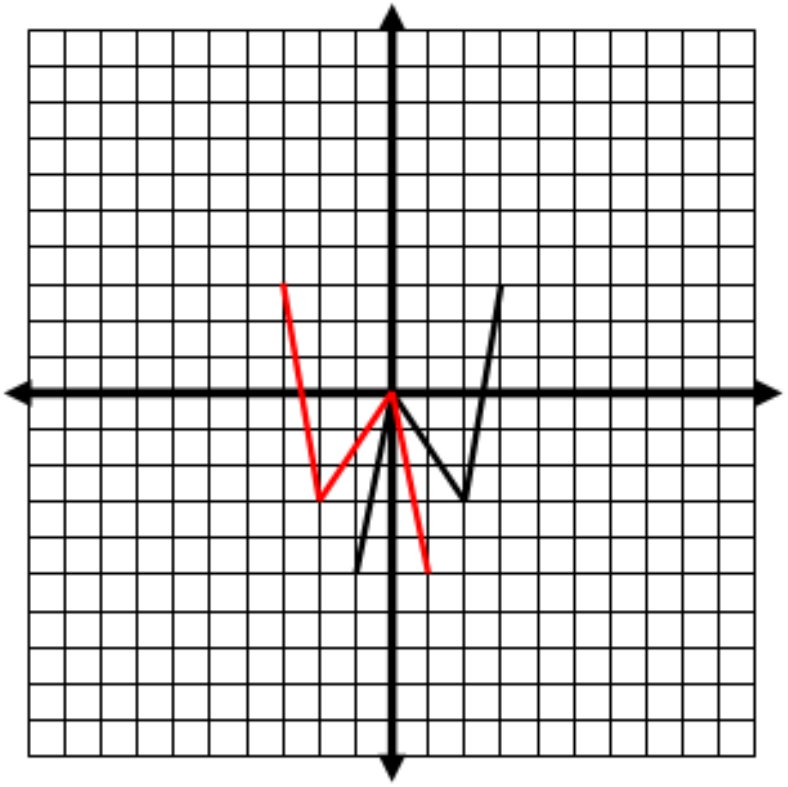
Equation	Effect to Fred's graph
Example: y=F(x + 18)	**Translate left 18 units**
1. y = F(x – 10)	**Translate right 10 units**
2. y = F(x) + 7	**Translate up 7 units**
3. y = F(x + 48)	**Translate left 48 units**
4. y = F(x) – 22	**Translate down 22 units**
5. y = F(x + 30) + 18	**Translate left 30 units and up 18 units**

Bottom Checkpoint p. 4

Equation	Effect to Fred's graph
Example: y=F(x + 8)	Translate left 8 units
1. y = F(x) + 29	Translate up 29 units
2. y = F(x – 7)	Translate right 7
3. y = F(x + 45)	Translate left 45
4. y = F(x+5) + 14	Translate left 5 and up 14
5. y = F(x – 6) – 2	Translate down 2 and right 6

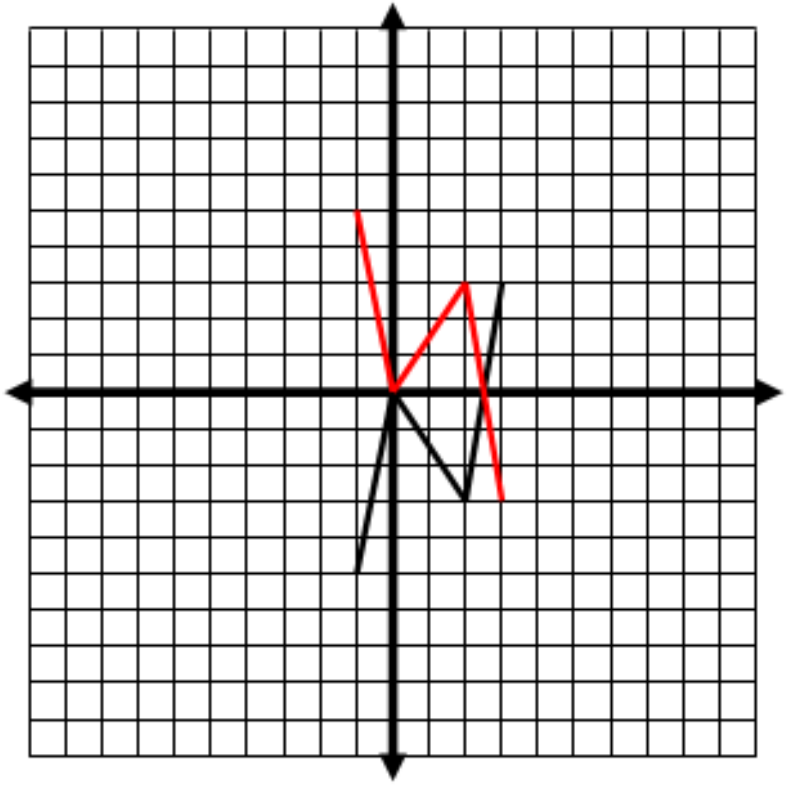
III. Checkpoint p. 7

1. $y = H(-x)$ reflection in y-axis



Reflection in the y-axis

2. $y = -H(x)$ reflection in x-axis



Reflection in the x-axis

Keep going!

Complete #43 – Checkpoint after #52, if not yet

VI. Checkpoint p. 9

1. Complete each chart below. Each chart starts with the characteristic points of Fred.

x	F(x)	3 F(x)
–1	1	3
1	–1	–3
2	–1	–3
4	–2	–6

x	F(x)	¼ F(x)
–1	1	¼
1	–1	–¼
2	–1	–¼
4	–2	–½

2. Compare the 2nd and 3rd columns of each chart above. The 2nd column is the y-value for Fred. Can you make a conjecture about how a coefficient changes the parent graph?

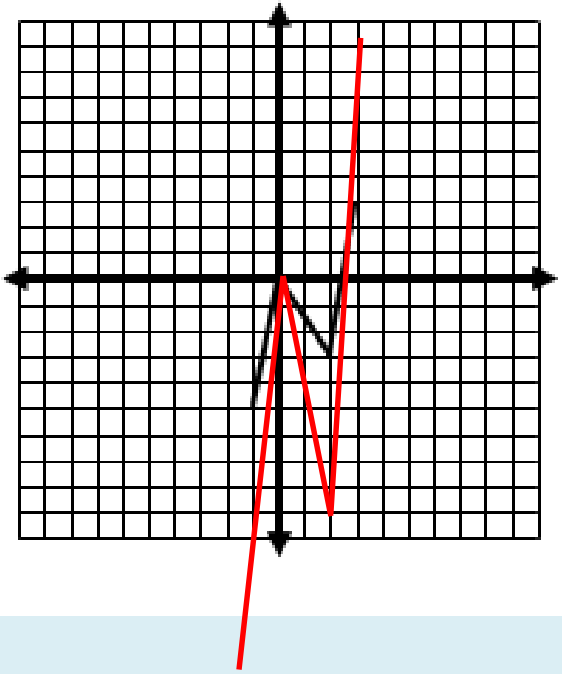
Students will likely say that a coefficient greater than 1 stretches the graph (makes it taller/steeper) and a coefficient less than 1 compresses it (makes it shorter/less steep). This is not fully accurate but will be addressed in the next investigation.

VIII. Checkpoint p. 10 (continues on next slide)

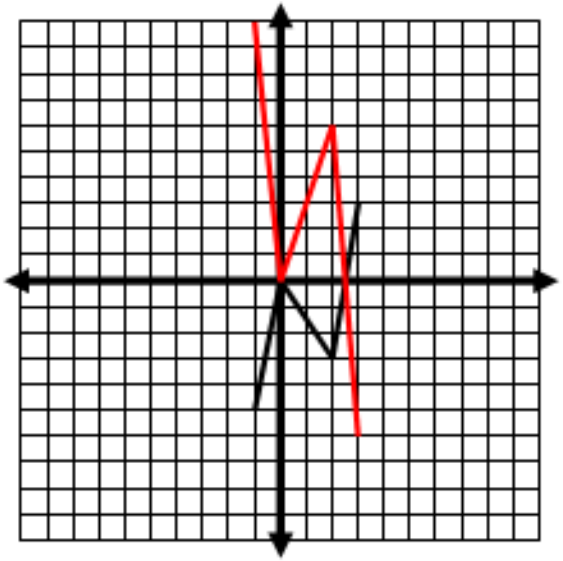
Equation	Effect to Harry's graph
Example: y=-5H(x)	**Reflect over x-axis, vertical stretch by 5**
d. y = 3H(x)	**Vertical stretch by 3**
e. y = -2H(x)	**Reflect over x-axis, vertical stretch by 2**
f. y = 1/2H(x)	**Vertical compression by 1/2**

VIII. Checkpoint (con't) p. 10

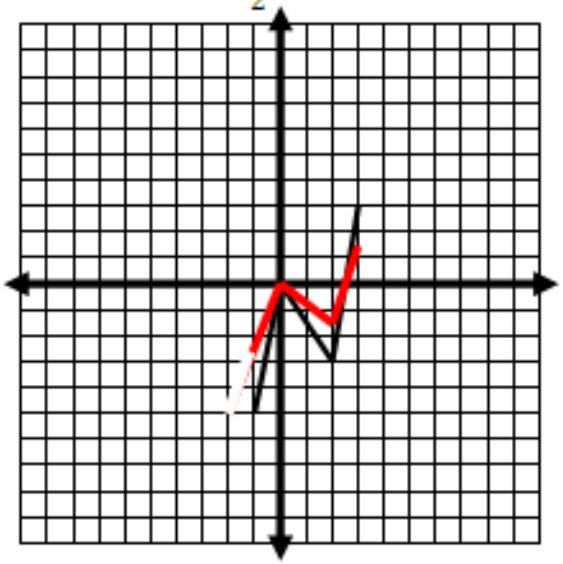
a. $y = 3H(x)$



b. $y = -2H(x)$



c. $y = \frac{1}{2}H(x)$



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